WATER PROCESSING:
QUALITY OVERVIEW

BY

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1.) IMPORTANCE OF TRAINING

The purpose of training is to free Ourselves from unnecessary barriers so as to move to the next levels 'BECAUSE KNOWLEDGE IS POWER'.

2.)

What is Quality?

3.) What is Quality?

Quality is satisfying consumer needs at the time of use.

4.) Three Categories of Quality for Water Processing

1. Quality of raw materials
2. Quality of finished products
3. Quality of people

5.) Quality of raw water (chemistry)

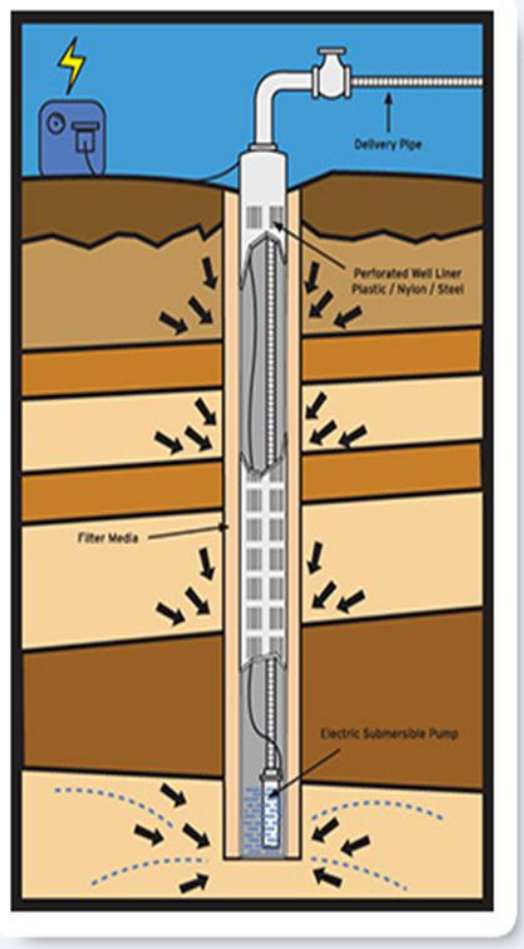
Raw water from deep wells (200 m deep);

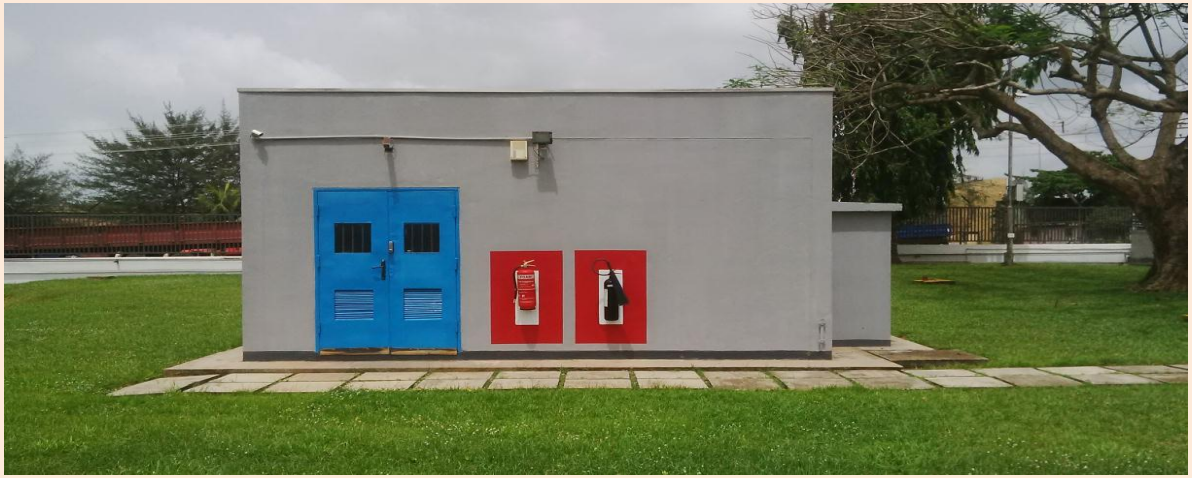
- pH: 5.0 - 6.0

- Conductivity: 40 - 60 µS/cm

- Iron: 1-3 mg/L

6) Source of raw water (deep well)





Deep well with sourcing at a depth of about 200 m into the earth's crust.

Free of pathogenic micro organisms and hazardous substances.

Situated in an ideal location where risks of contamination are virtually non existent.

7.) Quality of raw water (Micro-biology)

Microbiological Parameters	
Clostridium perfringes	Nil
Chromobacterium vialaceum	Nil
E. Coli	Nil
Feacal Streptococci	Nil
Klebsiella Aerogenes	Nil
S. Aerus	Nil
Yeast/Mould	Nil

8.) Quality of raw water (Contaminants)

CONTAMINANTS		
1	Lead	0.01 mg/L
2	Cyanide (as CN)	0.01 mg/L
3	Cadmium	0.003 mg/L
4	Arsenic	0.01 mg/L
5	Barium	0.05 mg/L
6	Mercury	0.00 mg/L
7	Pesticides	0.005 mg/L
8	Mineral oil	0.01 mg/L
9	Ammonia	0.05 mg/L
10	Phenol compounds as phenol	0.001 mg/L
11	Detergents as laury sulphate	0.01 mg/L
12	Radionuclides Bq/l	0.1 mg/L

9.) Quality of finished product (Chemistry)

Nigeria legislation / regulations (SON) NIS306:2008		
S/No	PARAMETERS	NIS SPECIFICATION
Physiochemical Parameters		
1	Chloride	100 mg/L
2	Fluoride	1.0 mg/L
3	Copper	1.0 mg/L
4	Iron	0.03 mg/L
5	Nitrate	10 mg/L
6	Nitrite	0.1 mg/L
7	Manganese	0.05 mg/L
8	Magnesium	2.0 mg/L
9	Total dissolved solids	500 mg/L
10	pH	6.5 - 8.5
11	Hardness (as CaCO3)	100 mg/L
12	Hydrogen Sulphide	0.01 mg/L
13	Sulphate	100 mg/L
14	Conductivity	1000 us/cm
15	Free Residual Chlorine	0.2 mg/L

10.) Quality of finished product (Chemistry)

CONTAMINANTS		
16	Lead	0.01 mg/L
17	Cyanide (as CN)	0.01 mg/L
18	Cadium	0.003 mg/L
19	Arsenic	0.01 mg/L
20	Barium	0.05 mg/L
21	Mercury	0.00 mg/L
22	Pesticides	0.005 mg/L
23	Mineral oil	0.01 mg/L
24	Ammonia	0.05 mg/L
25	Phenol compounds as phenol	0.001 mg/L
26	Detergents as laury sulphate	0.01mg/L
27	Radionuclides Bq/l	0.1mg/L

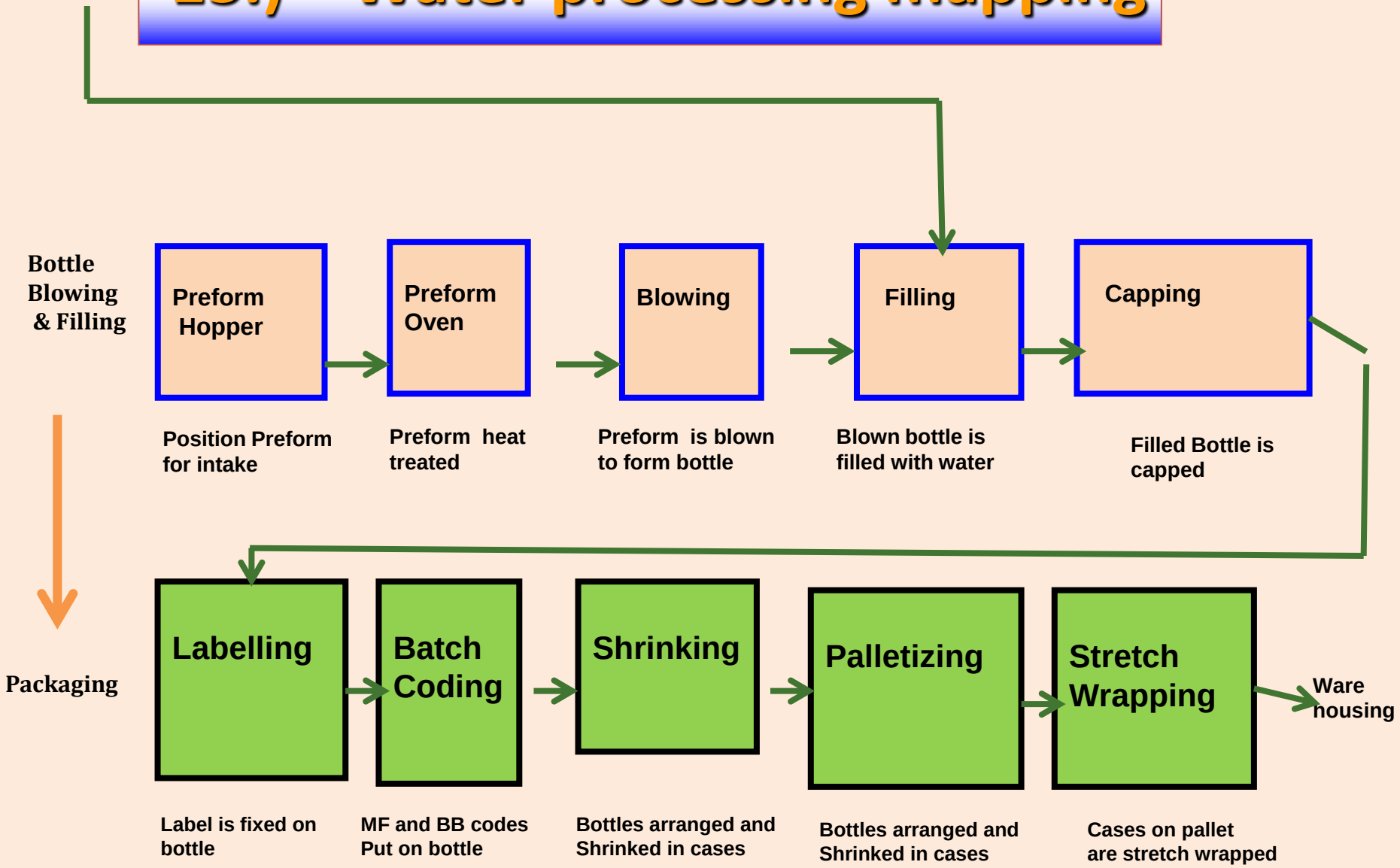
11.) Quality of the finished product (Microbiology)

Microbiological Parameters		
1	Clostridium perfringes	Nil
2	Chromobacterium vialaceum	Nil
3	E. coli	Nil
4	Feacal Streptococci	Nil
5	Klebsiella Aerogenes	Nil
6	S. Aerus	Nil
7	Yeast/Mould	Nil

12.) Why do we develop quality systems?

1) Quality system is designed and Implemented using quality Monitoring Scheme for zero defects and waste.
2) Quality system is used as a guardian for continuous improvement.
3) Quality system enhances the development of competences for food safety and full compliance.

13.) Water processing mapping



14.)

How do we manage Quality?

15.) DEDUSTERS USED WIDELY TO REMOVE PARTICLES FROM CAPS AND PREFORMS

Entering Requirements:

1-Handwashing

2-Shoe Cover

3-Ear protection

4-Overall with caps

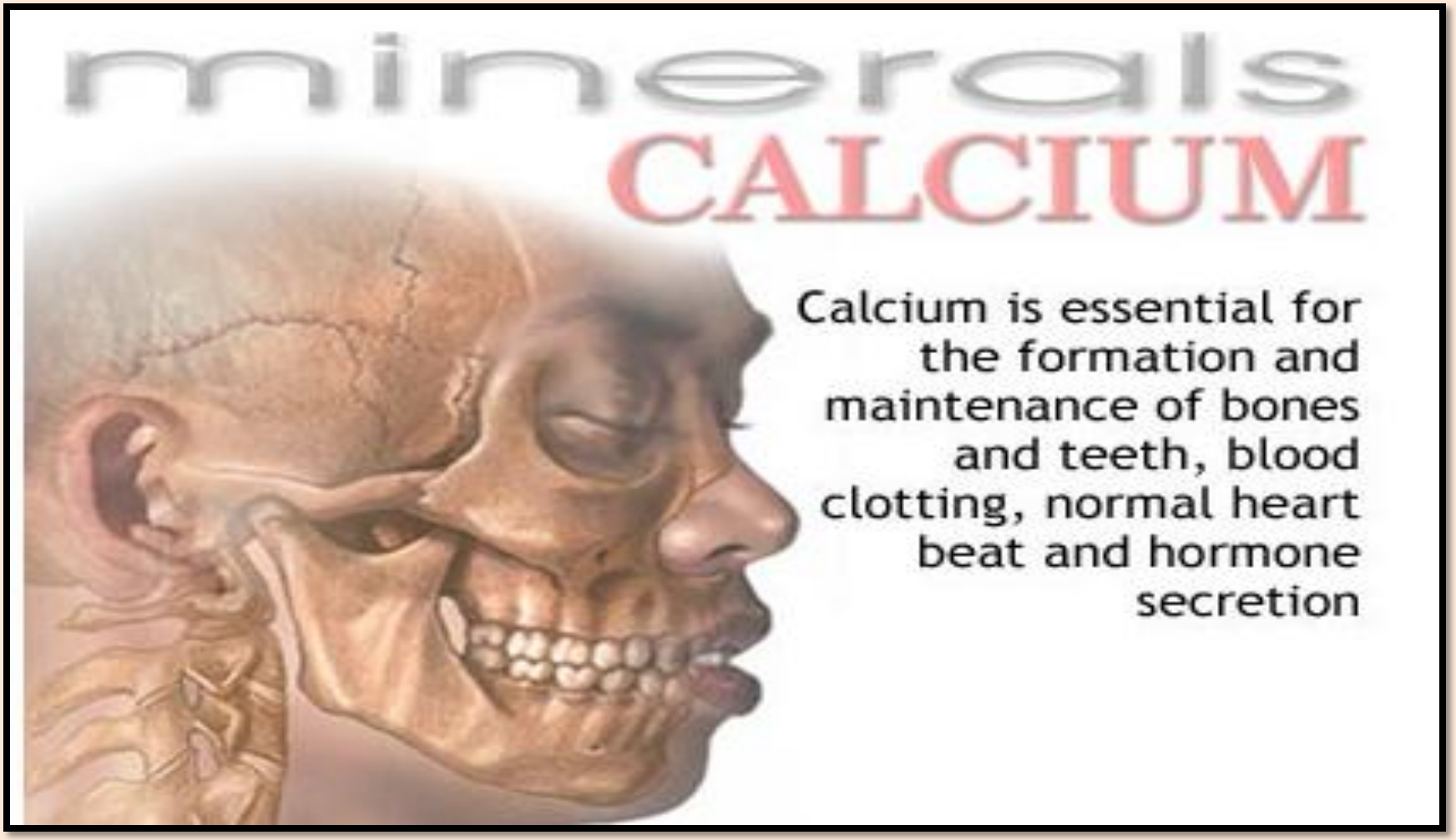
5-No eating/drinking

Details

1.Deduster suction pressure ≥ 0.8 bar

2. Deduster must be ON during Production.

16.) Importance of minerals in the processed water



17.) Importance of minerals

WHAT IS ZINC?
ZINC is basic constituent of our diet which plays an important role in the body functions.

WHAT ARE THE DIETARY SOURCES OF ZINC?
ZINC is found in red meat, some kinds of fish, pulses, vegetables and food grain.

WHAT ARE THE EFFECTS OF ZINC DEFICIENCY ON THE BODY?
Deficiency of ZINC can result in reduced immunity, retarded growth, mental lethargy, dryness of skin and lack of appetite.

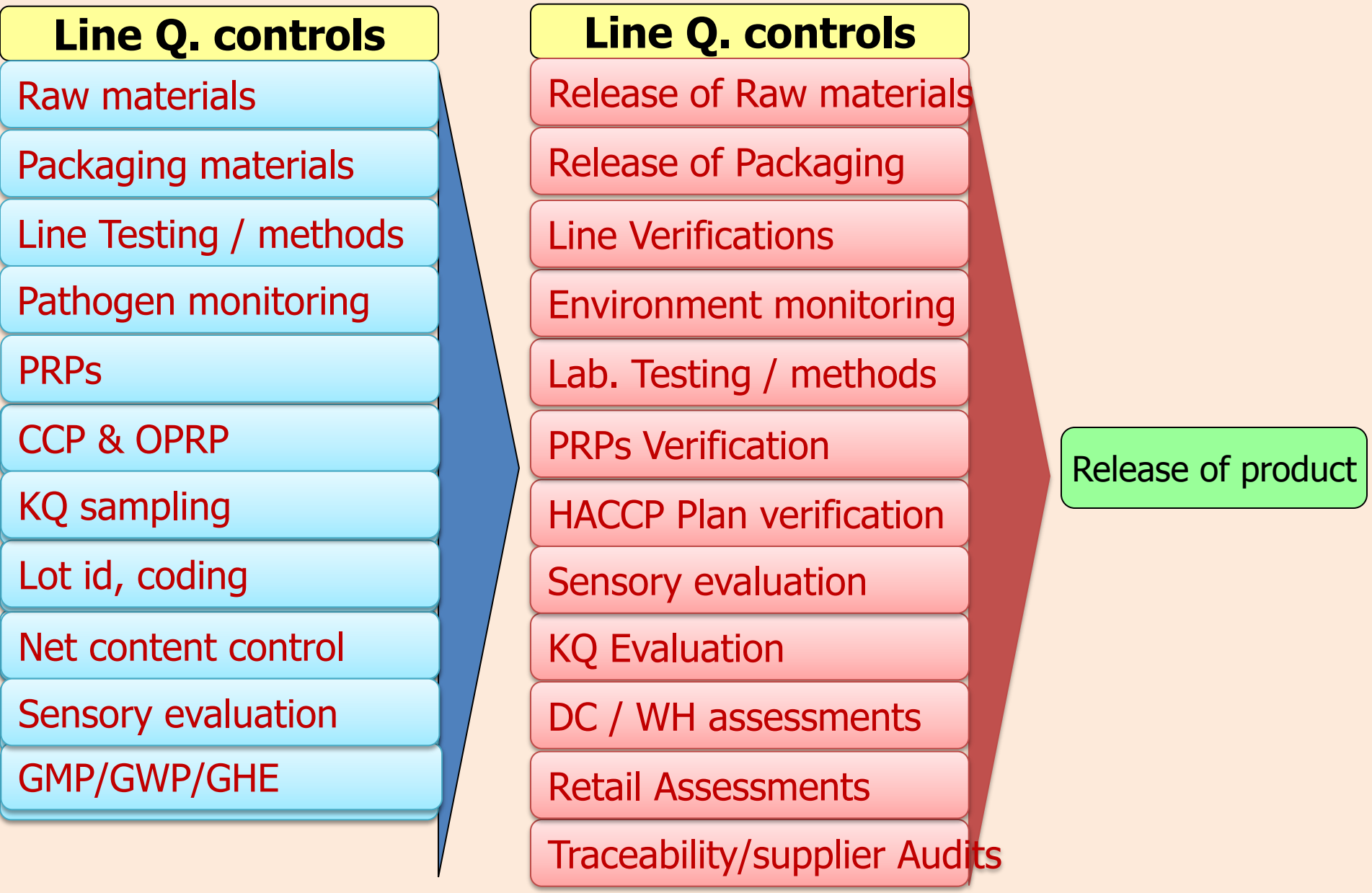
WHAT ARE THE BENEFITS OF ZINC?
- ZINC helps growth
- It keeps skin fresh
- It decreases mental lethargy and increases appetite.

The new Nestlé Pure Life PROTECT contains ZINC. Scientific research has proven that ZINC supports the body's immune system and provides more protection.

18.) Inspection types…

1. <u>In line-</u> In the processing line (mainstream)
2. <u>On-line / At-line</u> - In the processing area after taking a sample from the processing line
3. <u>Off- line</u> – In a quality laboratory after taking a sample from the processing line

19.) Line Quality controls/monitoring



Hygiene Rules For Processed Water

21.) Uniform

- All personnel entering processing areas must wear uniform
- Uniforms (overall, cap / head-gear, shoe) must be clean and properly worn
- Uniform should not be worn outside the factory
- Change of shoes before entrance to (Basic Hygiene +) area is mandatory (Example is filling room)

22.) Headwear

- All persons entering production and water treatment areas must wear a hair cover that covers all hair on the head
- Hair should be kept clean and neat
- Do not wear hair accessories, e.g. curlers, combs,
- hairclips, in processing areas

23.) Fingernails

- Fingernails should be kept short and clean
- Food residues and dirt can get caught in long nails and these can harbor harmful bacteria
- Long nails can become a source of foreign matter when it chips off
- Do not wear nail varnish to processing areas: they can also chip off

24.) Cleaning

- Keep floors, walls, doors, windows and your work areas clean and tidy at all times
- Keep external areas – passages, surroundings, drains, gutters, etc – clean and tidy
- Keep toilets, cloak rooms, canteens, stores, etc clean and tidy
- Ensure rubbish is kept covered
- Keep / dispose wastes in organised manner
- Clean and mop up spillages immediately
- Keep all tools, equipment, utensils clean and in good conditions and at the correct locations
- Mark / label all materials – chemicals, cleaning materials, etc.

25.) Health

- Personnel suspected to be suffering from diseases transmitted via food, e.g., diarrhoea, vomiting, skin infection, sores and infected wounds, should not work in the factory.
- Personnel with cuts, wounds, contagious diseases, etc. should be away from processing areas.
- All illnesses, diseases, skin problems, sores, wounds, etc. must be reported to the superior, and visit made to the Clinic for treatment
- Cuts, wounds, boils or sores should be covered with an antiseptic dressing and a waterproof protection

26.) Smoking

- Smoking is prohibited in food processing areas
- Smoking is prohibited in and around areas with inflammable materials
- Smoking in the factory can cause fire
- Cigarette ash or butt could be a source of foreign material contamination

27.) Other Poor Hygiene Habits

- Spitting and discarding of nasal secretions on the floor or the factory yard.
- Picking of nose(toothpicks), ear, teeth; scratching of hair / body
- Combing hair in the plant
- Littering the factory yard
- Wearing strong perfumes in processing areas
- Sitting, lying down or putting feet, tools, soiled materials on surfaces which come in contact with the product.
- Use of empty bottles for other purpose

28.) Examples of food safety hazards

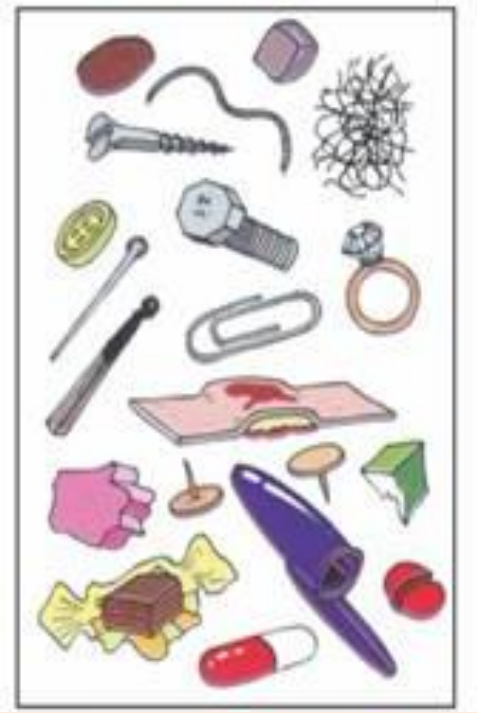
Physical

Metal pieces;

glass;

stones;

Wood: Bone

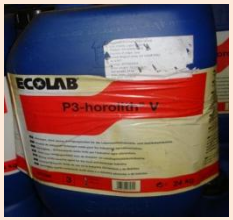


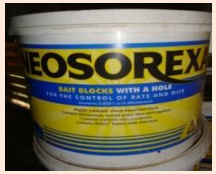
Chemical

Lubricants;

Paints; Fuel;

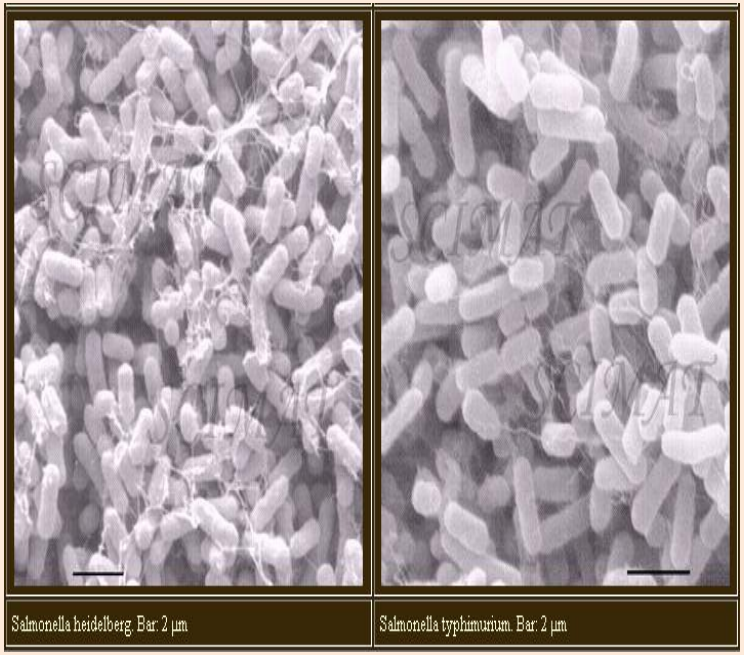
Cleaning agent





Microbiological

Pseudomonas Aeruginosa



29.)

PREVENTION STRATEGIES

- **Zoning separates each production process to avoid cross contamination.**

30.) PREVENTION STRATEGIES FOR PEST AND DUST.

Preform

Preform and Cap hoppers MUST be closed completely when not in use.

MUST remain closed as much as possible Delivery doors

Shutter doors MUST not be open at the base.

31.)PREVENTION STRATEGIES FOR PESTS, DUSTS, INSECTS

Cleaning tools MUST not be outside their defined zones and clean.

Hand washing is a MUST when entering into the filling room/floor.

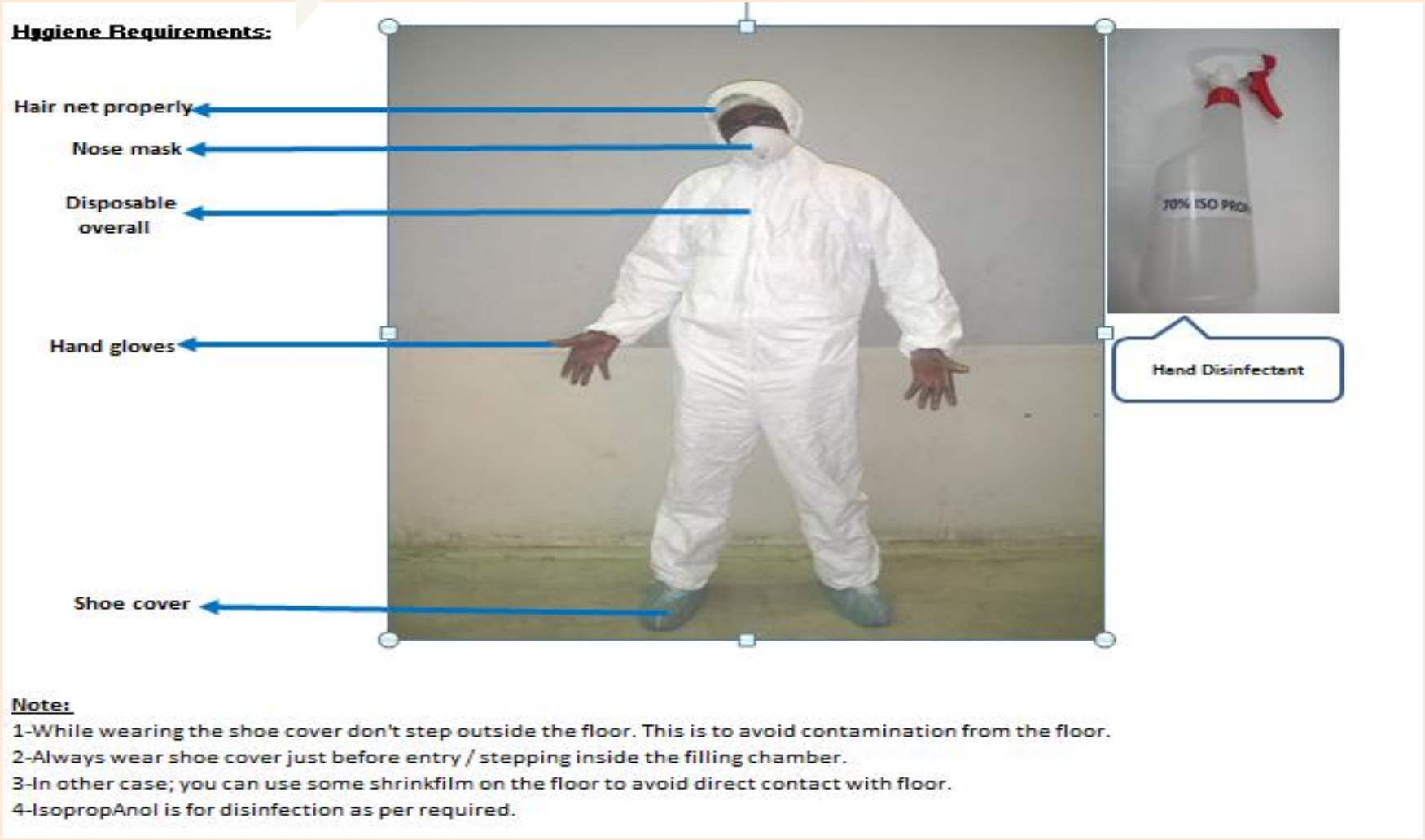
Cap, Overall, Safety Boots MUST be worn at all areas in production floor.

32.)

Cleaning materials
can be a source of plastic FB

33.) Prevention strategies.

Respect High Hygiene Zone Rules.

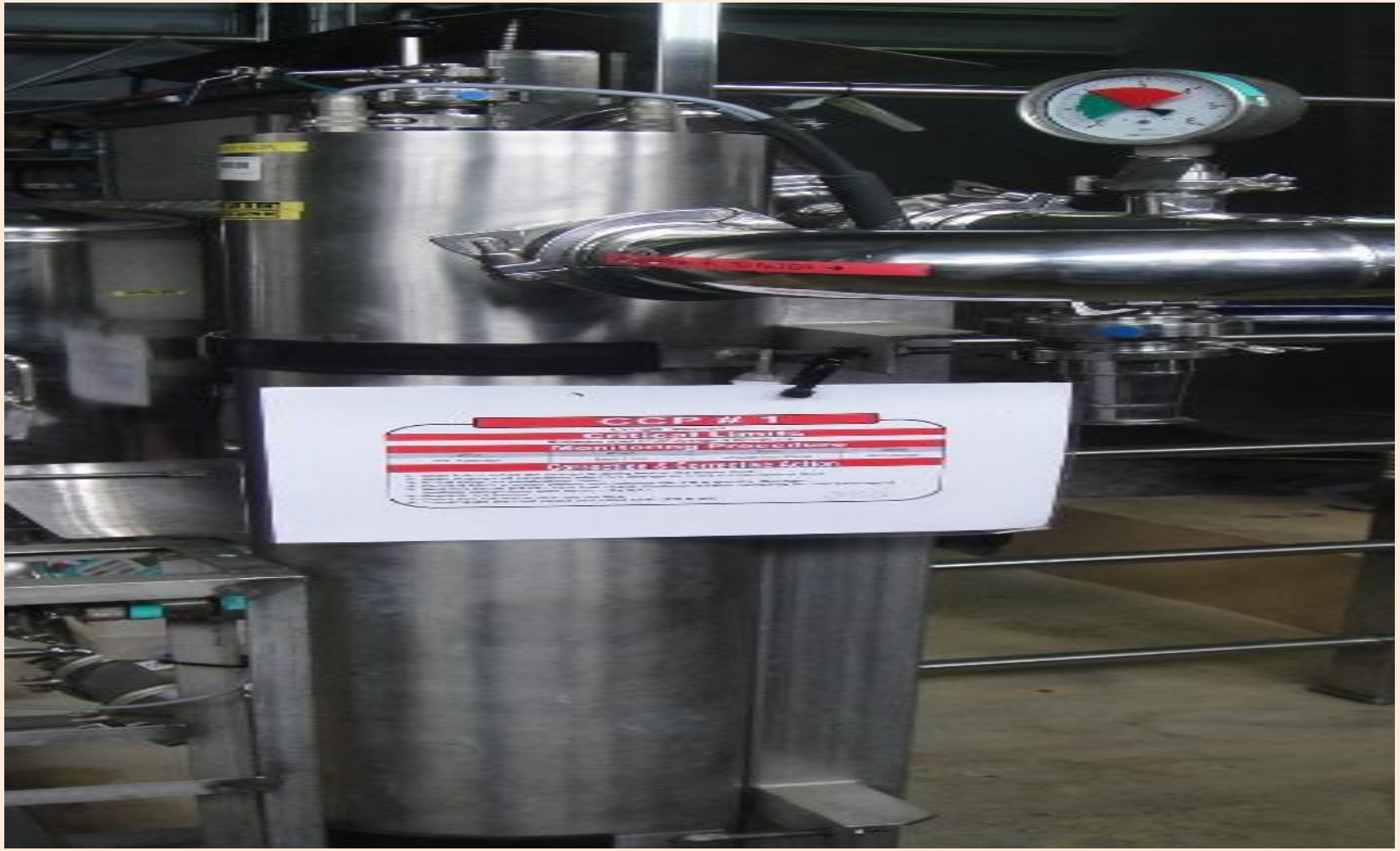


Note:

1-While wearing the shoe cover don't step outside the floor. This is to avoid contamination from the floor.
2-Always wear shoe cover just before entry / stepping inside the filling chamber.
3-In other case; you can use some shrinkfilm on the floor to avoid direct contact with floor.
4-IsopropAnol is for disinfection as per required.

34.) Plastic pallet (prevention strategies)

35.) Ultraviolet Light (CCP)…



36.) Insectocutor (prevention strategies)…

Insect Lights "Insect-o-cutor" MUST be on a regular inspection schedule

37.) CIP SYSTEMS FUNCTIONALITY.

CIPs must be in-line with the 5T principles, having appropriate: Technology / Turbulence / Titration / Temperature / Time schedules ==> An essential 6th T is training.

6Ts of CIP must be respected and validated. All CIP must be validated and audited/verified on a regular basis.

Separate systems must be installed for the raw material and processed product circuits to prevent cross contamination where this represents a risk.

Access must be provided to critical parts of the line for their visual inspection and manual cleaning, if necessary.

The 6Ts of CIP must be respected and validated. All CIP must be validated and audited/verified on a regular basis.

38.) CIP SYSTEMS INSTALLATIONS

Stainless steel is the preferred material for surfaces - if other metals or materials are present, suitable and compatible cleaning agents and conditions must be chosen.

Equipment / system and pipework configuration must allow for complete draining of the whole circuit. There must be no dead-ends or circuits that are not cleaned.

The hook-up plates and double-seated valves between the production plant and the CIP pipework must ensure faultless operation of the cleaning cycle, with absolutely no chance of cross-contamination of chemical to product. Mix-Proof valves are preferred for prevention of product contamination.

Instruments, sensors and sampling points must be provided at suitable points of the cleaning circuit in order to control conditions, such as temperatures, and to test effectiveness. But such equipment must not in itself constitute a point that collects residues and is difficult to clean.

The processing, accurate and careful use of cleaning and disinfecting agents in production and facilities plays an important, if not decisive, role in assuring the quality of products.

39.) Operating a CIP system…

Complete cleaning instructions for each CIP circuit must be clearly displayed and their execution entrusted to trained personnel.

To guarantee leak-free separation between production and CIP during non-cleaning cycles, a discharge of any leaks to a drainage system is recommended.

Maintenance of circuits is essential, e.g. of gaskets to ensure CIP effectiveness and efficiency must be maintained.

All elements of CIP must be monitored like cleaning cycles, but also the status of cleaning fluids, rinse water, etc.

Material Safety Data Sheet (MSDS) requirements must be respected

Cleaning-in-place systems must be linked to a recording system, allowing easy monitoring and documentation of the whole CIP process.

40.) Filters…

INSPECTION.

Must be done…

- Respect of the filter change plan.
- Use recommended filter types.
- Carry out Integrity test After Every CIP,
  after Hot water disinfection & after Filter Change.
- Filters for Filling Chamber to be cleaned once per month.

Visual management: showing indentity and location (How 5s works?)

41.)

42.) PREVENTION STRATEGIES

- Do not transport bottle water with odour-emitting products like naphthalene, paints, soap, acid, animal foods, meat, diesel and vegetables

- **Bad transportation of the product will increase customers refusal and trade returns, be careful to**

43.) …because they trust us;

We must ensure the continuous delivery of safe, quality products as the indispensable base for consumer trust

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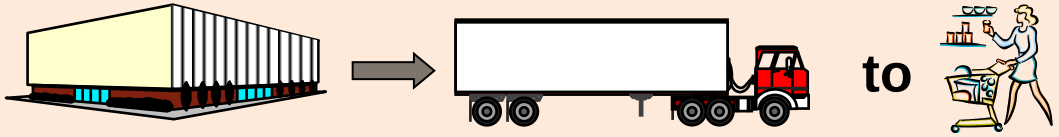
WAREHOUSE BEST PRACTICES AND HYGIENE

44.) Vehicles must be clean and odour free



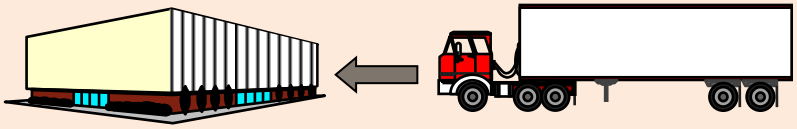
Vehicles must be safe with brakes and lights operational. Emission within limits. Tyres with legal tread; "no bad/smooth tyres“

- Vehicles should be waterproof- Closed roof vehicles recommended

The vehicle should be locked when unattended and drivers must be licensed and experienced

WAREHOUSE BEST PRACTICES AND HYGIENE

45.) Requirements that should be satisfied:



Incoming Vehicles should be under cover of a water proof canopy

- Access to the site should be sufficient for the vehicle size and normal replenishment load from the distribution centre.

Roads have to be sealed to allow all weather access

46.) OUR ATTITUDE WILL MAKE A GREAT DIFFERECE

Act proactively
Training (self and team)
Technology: use the tools
Information: use the available information & communicate to others
Team effort
Unending: Continuous improvement
Discipline
Ensure compliance

47.) BUSINESS PRINCIPLES TRUST

*Quality is about trust. Each and every one of us has the power to influence this trust through our dedication to the quality of our products and through our products and through our passion and leadership.

48.) Functions of water

- Water is a component of blood, and constitutes up to 90% of blood.
- Water is a component of protoplasm (the living substances of the body) and makes up 90% of protoplasm.
- Water is a component of all secretions in the body such as tears and enzymes.
- Water is necessary for digestion; food must mix with water before enzymes can act on it.
- Water is necessary for absorption of food.

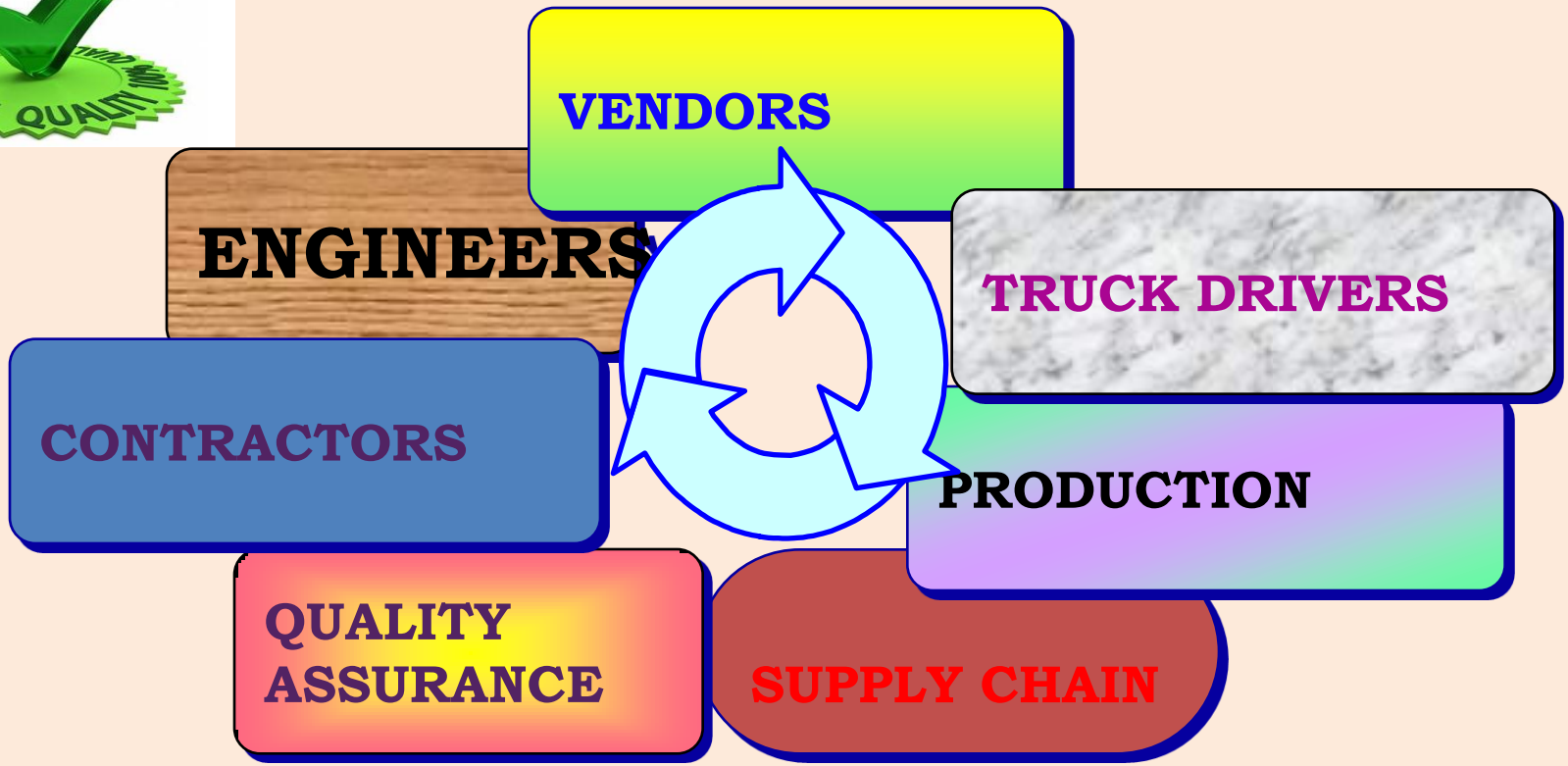
49.) Functions of water

- Water is necessary for growth because it is a component of the body substance, protoplasm.
- Chemical reactions in the body take place in an aqueous(water) solution.

50.) Statistics of Water Borne Diseases

According to UNICEF data in 2015, 1,400 children die each day based on diarrhoea water borne disease.

51.) QUALITY IS MADE BY EVERYBODY….



Teamwork is key to the successful applications

Together We Achieve More !

- Thank You

Thank You